(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 25 August 2005 (25.08.2005)

PCT

(10) International Publication Number WO 2005/078932 A1

- (51) International Patent Classification⁷: H03K 19/0185, G06F 13/40, G05F 1/56
- (21) International Application Number:

PCT/IB2004/052934

(22) International Filing Date:

29 December 2004 (29.12.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

04100111.6

15 January 2004 (15.01.2004) E

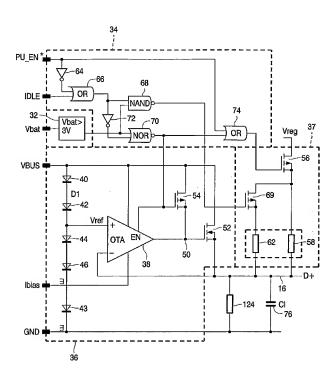
- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): STOPEL, Rick, F.,

J. [NL/SG]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). TJIA, Jerome [SG/SG]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

- (74) Agents: ELEVELD, Koop, J. et al.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: PULL-UP CIRCUIT



(57) Abstract: A pull-up circuit comprises an operational amplifier which forms part of a feedback circuit, acting to bring a pull-up circuit output equal to a reference voltage input. The pull-up circuit may form part of a USB transceiver for incorporation in a USB Device. When the supply voltage of the USB Device is sufficiently high, it is used to provide the required pull-up voltage, with the feedback circuit including the operational amplifier being enabled only when the supply voltage of the USB Device is not high enough to provide the required pull-up voltage. In that case, the USB bus voltage is used to generate the reference voltage which is used as an input to the feedback circuit.

WO 2005/078932 A1



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

 as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.